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ABSTRACT

Findings of current research on children in day care and theory-based early intervention programs are summarized in the two sections of this report. Section 1 provides findings on children's development, different kinds of day care, and children's socialization. Findings related to Piagetian, Montessori, and other intervention program models, as well as results of program evaluations, are given in Section 2. The pages of the summary are organized in columns: the first column lists the findings, the second lists bibliographic information, and the third provides interpretation of the findings. (RH)

MATRIX NO. 3

RESEARCH ON CHILD CARE

by

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Interest in early childhood development and learning and the related concern for child care have led to vast amounts of research over the past two decades. The questions about the impact of child care experience on young children are partially answered by the research findings.

In addition to the concern for the impact of child care experiences on children is the concern about the impact and value of early intervention programs. Many of these intervention programs were developed to address the problems of children in poverty.

This section provides current research information on child care and early intervention programs. The pages are organized in columns. Column 1 provides the research findings; Column 2 supplies the sources of the findings; and Column 3 provides interpretations of the findings. The findings are organized, in addition, around topic areas of research relating to children's development, kinds of day care, and children's socialization. Special attention is given early intervention programs based on Piagetian Theory.

RESEARCH ON CHILD CARE

SECTION ONE
RESEARCH RELATING TO CHILDREN IN DAY CARE

I. Research Relating to Children's Development

Day care affects the intellectual, emotional, and social development of young children. *Intellectual development.* Some researchers believe that the cognitive development of children under age 3 is not harmed by day care, and that many children benefit significantly from the experience. Other researchers have suggested, based on standardized testing, that day care has neither salutary nor adverse effects on most children. *Emotional development.* Day care does not weaken the mother-child emotional bond. When young children interact with adults in a day care program, their basic emotional relationship with their mother is not jeopardized. *Social development.* Peer interaction adds a new dimension to children's lives when they enter a day care environment. Their social development is enhanced or impaired depending on the program's objectives and philosophy.

Findings	Source	Interpretation
Intellectual Development		
Scores on intellectual development are not lower for infants and toddlers in day care than for those who are reared at home.	Caldwell, B. What does research teach us about day care: For children under three? *Children Today*, January-February 1972.	The cognitive or intellectual development of children under age 3 is not harmed by experiences in a day care environment, and many young children benefit significantly from the experiences.
Scores on intellectual development of disadvantaged children are higher for those in day care than for those who are reared at home.	Belsky, J. & Steinberg, L. The effects of day care: A critical review. *Child Development*, December 1978.	
Scores on intellectual development of disadvantaged children are generally not increased by the day care experiences but do not show declines.	*Ibid.*	The day care experience has neither salutary nor adverse effects on the intellectual development (as assessed by standardized tests) of most children.

Findings	Source	Interpretation
Intellectual Development (continued)	Kagan, J., Kearsley, R., & Zelazo, P. *Infancy: Its place in development.* Cambridge, MA: Harvard University Press, 1978.	
	Ramey, C., & Smith, B. Assessing the intellectual consequences of early intervention with high-risk infants. *American Journal of Mental Deficiency,* January 1977; Ramey, C., & Campbell, F. The prevention of developmental retardation in high-risk children. In P. Mittler (Ed.), *Research to practice in mental retardation. Vol. 1. Care and intervention.* Baltimore, MD: University Park Press, 1977.	For economically disadvantaged children over 18 months of age day care may have an enduring positive effect by preventing declines in test scores associated with high-risk populations.
	Golden, M., *et al. The New York City Infant Day Care Study.* New York, NY: Medical and Health Research Association of New York City, Inc., 1978.	
	For summary of evidence documenting such declines, see Golden, M., & Birns, B. Social class and infant intelligence. In M. Lewis (Ed.), *Origins of intelligence.* New York, NY: Plenum Press, 1976.	
Emotional Development		
If attachment of the child to the mother exists, then the day care experience does not affect the emotional bond.	Bowlby, J. *Maternal care and child health.* Geneva, Switzerland: World Health Organization, 1951; Goldfarb, W. The effects of early institutional care on adolescent personality. *Journal of Experimental Education,* December 1943; and Spitz, R. *Hospitalism: An inquiry into the genesis of psychiatric conditions in early childhood. Vol. 1. Psychoanalytic study of*	Infants and toddlers are able to relate to adults other than the parent without jeopardizing the basic emotional relationship of the child to the mother.
There are no differences in the mother-child bond between children in day care and children reared at home.		

Findings	Source	Interpretation
Emotional Development (continued)		
	the child. New York, NY: International Universities Press, 1945. Blehar, M. Anxious attachment and defensive reactions associated with day care. *Child Development,* September 1974.	
	Ricciuti, H. Fear and development of social attachments in the first year of life. In M. Lewis & L. Rosenblum (Eds.), *The origins of human behavior: Fear.* New York, NY: John Wiley & Sons, Inc., 1974.	
	Farran, D., & Ramey, C. Infant day care and attachment behavior towards mothers and teachers. *Child Development,* September 1977.	
	Kagan *et al., op. cit.*	
Social Development		
When compared with agemates reared at home, day care children tend to interact more with peers in both positive and negative ways. That is, they are more likely to cooperate with, as well as aggress against, their agemates. Some evidence suggests, however, that children enrolled in day care for extended periods show increased apprehension toward adults and decreased cooperation with them, as well as a lessened involvement in educational activities once they enter school.	Bronfenbrenner, U. *Two worlds of childhood: U.S. and U.S.S.R.* New York, NY: Russell Sage Foundation, 1970; and Bronfenbrenner, U. Reaction to social pressure from adults versus peers among Soviet day school and boarding school pupils in the perspective of an American sample. *Journal of Personality and Social Psychology,* July 1970.	The peer relationship is a new dimension for young children which is not present in the home. There needs to be more attention to the role of peers in social development in day care settings.
	Schwarz, J., Strickland, R., & Krolick, G. Infant day care: Behavioral effects at preschool age. *Developmental Psychology,* July 1974.	
	Belsky & Steinberg, *op. cit.*	

Findings	Source	Interpretation
Social Development (continued)		
The effects of day care on the social development of children are linked to the objectives and philosophy of the program.	Macrae, J., & Herbert-Jackson, E. Are behavioral effects of infant day care program specific? *Developmental Psychology,* May 1975.	When programs stress *acting-out;* impulsivity, and individual expression, these behaviors are evident in children's behavior. When they stress cooperation and restraint, these behaviors are evident in the children.

II. Research Relating to Kinds of Day Care

The concerns about the possible adverse effects of day care on children have focused primarily on infants and toddlers because of their need for sustained care and emotional attachment to an adult – usually their mother. When it becomes reasonably clear that children who attend day care are not affected adversely (with some exceptions in social development), then research on day care as a functioning program or service may be examined. The issues inherent in day care that lend themselves to research include (1) locus of care, (2) health, (3) number and age mix in family day care, (4) staff training, (5) group size and staff/child ratio, (6) subsidized day care, and (7) parent involvement.

Findings	Source	Interpretation
Locus of Care in Family Day Care		
Adults are more accessible in home-based care than in center care.	Prescott, E. *A comparison of three types of day care and nursery school-home care.* Paper presented to the Society for Research in Child Development, Philadelphia, PA, 1973.	Children are able to receive more attention in family day care than in center care.
In 37% of homes studied, caregivers are rated as doing little to encourage exploration and curiosity.	Peters, D.L. *Day care homes: A Pennsylvania profile.* University Park, PA: Pennsylvania State University, College of Human Development, 1972. (ERIC Document: ED 097 097. Available from: ERIC Document Reproduction Service, Computer Microfilm International, P.O. Box 190, Arlington, VA 22210.)	Peters finds that family caregivers do not see their role as stimulators of child development. Caregivers are more willing to let children watch TV than to interact with them in educational activities.

Findings	Source	Interpretation
Locus of Care in Family Day Care (continued)		
Preplanned education or play activities are the exception, not the rule. TV watching is the most frequently observed activity.		
Family caregivers appear to be more restrictive and directive in their behavior than most center caregivers.	Cochran, M.M. A comparison of group day and family child-rearing patterns in Sweden. *Child Development,* 1977, 48, 702-703.	Caregivers function more as parents in family day care than as teachers. This is more common in centers. There is virtually no curriculum in family day care. The focus is on protective care in a supportive setting.
Family caregivers are highly involved with the children in their care.	*Ibid.*	Caregivers interact with the children but not in educational or developmental ways. They have more control over children's behavior.
Caregivers do not spend much of their time with the children in educational or developmental activities.		
On the average, day care mothers spend about 1/2 of the day interacting with the children, another 1/6 of their time supervising or preparing for the children, and only 1/3 of the day in household chores, watching TV or engaging in other recreational activities. They taught the children 14% of the time and conversed with the children 3% of their time.	*National Day Care Home Study* (Vol. III). Final report (Contract No. HEW-105-77-1052) to Administration for Children, Youth and Families, Office of Human Development Services. Washington, DC: U.S. Department of Health and Human Services, June 1980. P. 276. *Ibid.*, 196-199.	Very few day care workers receive training in child care work. Those likely to be trained are mothers who operate licensed homes under the sponsorship of a local agency, which refers children to homes in the network and provides training and technical assistance to day care mothers.

Findings	Source	Interpretation
Locus of Care in Family Day Care (continued)		
		The findings from Peters's study do not agree with the National Day Care Home Study (NDCHS) findings. The difference may be one of definition. The NDCHS defines teaching as any informal interaction in which the child learns.
Educational TV provides more language mastery experiences than the caregiver in family day care.	Carew, J.V., *et al.* Observed intellectual competence and tested intelligence. In S. Cohen & T.J. Comiskey (Eds.), *Child development: A study of growth processes* (2d Edition). Itasca, IL: F.E. Peacock Publishers, Inc., 1977.	Children in family day care learn about language from TV. There is no assurance that the caregivers build on that experience.
Center day care caregivers provide more language mastery experiences than family caregivers.		Center caregivers perceiving themselves more as teachers than surrogate parents provide language mastery experience.
Caregivers who provide the stimulating/structuring/participating role with children contribute more to the later measured developmental scores than when children provide their own intellectual stimulation (in independent play that does not involve the caregiver).	Carew, J.V. *Experience and the development of intelligence in young children at home and in day care.* Cambridge, MA: Harvard Graduate School of Education, March 1978.	Caregivers — whether in a family day care setting or in a center — are capable of acquiring an appropriate role to help stimulate children's intellectual development.
Health		
Infants have the highest rate of respiratory disease experiences.	Peters, A.D. Health support in day care. In E.H. Grotberg (Ed.), *Day care: Resources for decisions.* Washington, DC: U.S. Department of Health and Human Services, 1971. Pp. 315-339.	Infants are more vulnerable than children 1 year old or older.

Findings	Source	Interpretation
Health (continued)		
Infants in a day care center and infants at home have the same amount of respiratory disease experience.		A center is able to permit infants with respiratory infections to attend.
Number and Age Mix in Family Day Care		
When infants are present, caregivers tend to do less teaching, playing, and watching TV with the older children.	*National Day Care Home Study, op. cit.*	Infants demand more time than 1- and 2-year olds and benefit more from the caregiver than the 1- and 2-year olds.
The amount of time 1- and 2-year olds spend with peers increases as the caregiver becomes more involved with infants.	*Ibid.*, 277.	When infants are present, 1- and 2-year olds turn to each other for play and interaction.
When the number of children ages 12 to 35 months increases, there are fewer paints, water, and dough activities and more directions.	*Ibid.*	Children become a little more unruly in homes with several 1- and 2-year olds. The caregiver spends more time controlling their behavior and less time engaged in developmental activities.
When several preschoolers are present, there is more language learning from the caregiver, and all children engage in more large muscle play – climbing, jumping, and riding tricycles.	*Ibid.*	Preschoolers can enhance the language and developmental activities of each other and younger children.
1- and 2-year-old children spend more time alone and receive less caregiver attention when several preschoolers are present.	*Ibid.*	1- and 2-year-old children do better in homes with fewer children regardless of their age.

Findings	Source	Interpretation
Number and Age Mix in Family Day Care (continued)		
When the age mix is greater, children interact more.	*Ibid.*	When selecting a home, parents must consider their child's age and the age mix of the children in the day care home.
When a school-age child is present, 3- and 4-year-old children watch less TV, and 1- and 2-year olds engage in more language-facilitating activities.	*Ibid.*, 278.	The presence of a school-age child does not seem to have a detrimental effect on the other children in the home, and seems to increase social and verbal interaction.
Staff Training		
Caregivers, at centers or in homes in which training is relevant to young children, promote greater development in the children.	Ruopp, R. *et al. Children at the center: Final report of the National Day Care Study.* Cambridge, MA: Abt Associates, Inc., 1979.	Child development training is critical to having effective staff.
Years of formal education are not related to the effectiveness of child care.	*National Day Care Home Study, op. cit.*, 279.	Child-focused training is more important than years of education.
Years of experience generally are not critical in determining the quality of caregiving.	*Ibid.*, 280.	Child development training is more important than years of experience in determining the quality of caregiving.
Older caregivers frequently are more controlling, more directive, and negative. Younger caregivers provide more help, comfort, and teaching.	*Ibid.*	Children in the homes of younger caregivers have experiences somewhat different from those of children in homes of older caregivers. Parents should determine what experiences their children need.

Findings	Source	Interpretation
Group Size and Staff/Child Ratio		
A ratio of from 1:1 to 1:4 for infants and toddlers optimizes the quality of care and stimulation provided, and increases scores on developmental performance.	Haith, M.M. *Day care and intervention programs for infants under two years of age.* Cambridge, MA: Harvard University, 1972. Fowler, W. How adult/child ratios influence infant development. *Interchange,* 1975, 6(1), 17-31. Fowler, W. The effect of early stimulation: The problem of focus in developmental stimulation. *Merrill-Palmer Quarterly,* 1969, 15(2), 157-170. Willis, A., & Ricciuti, H. *A good beginning for babies: Guidelines for group care.* Ithaca, NY: Cornell University Press, 1974.	Infants and toddlers are highly dependent on others for movement, physical care, social and emotional relationships, intellectual stimulation, and communication.
Caregivers with groups composed of small numbers of 3- to 5-year-old children are associated consistently with better quality day care. Group sizes vary from 12 to 24. Typically, desirable behaviors decrease in frequency by roughly 20%, and undesirable behaviors increase by 20%, as group size increases within this range.	Ruopp, R., *et al., op. cit.*	Children cannot receive the individual attention they need in large groups. Large groups actually are detrimental to development.
High staff/child ratios do not guarantee quality; and if not determined in concert with group size, do not compensate for the negative effects of large group size.	Smith, A.W., & Spence, C.M. National Day Care Study: Optimizing the day care environment. *American Journal of Orthopsychiatry,* October 1980, 50(4).	Adding more staff to a large group does not counteract the negative aspects of large groups. Both group size and staff/child ratio should be considered for quality care. There are desirable limits to staff/child ratio.

Findings	Source	Interpretation
Subsidized Day Care		
Centers serving federally subsidized children have better staff/child ratios, offer a broader range of supplementary services to children and families, and use more staff providing specialized services, such as nurses or nutritionists.	*Appropriateness of the Federal Interagency Day Care Requirements.* U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, June 1978.	Federally subsidized day care centers have a more comprehensive program and, generally, are of higher quality than nonsubsidized centers.
Racial and economic segregation are not more prevalent in federally subsidized centers than in parent-fee centers. Most of the center-based care used by low-income and minority families, however, is provided in subsidized centers.	*Ibid.*	Segregation patterns are not altered by subsidized day care. Many states contract with day care centers, rather than with family home day care, for services to families eligible for subsidized programs.
Parent Involvement: At Home		
Parents who provide intellectual stimulation for their children enhance their development. Children are stimulated by having opportunities to enlarge their vocabularies; having access to learning supplies, books and periodicals; and having opportunities to explore the larger environment.	Werner, E.E., & Smith, R.S. *Kauai's children come of age.* Honolulu, HI: The University Press, 1977.	Educational stimulation and emotional support from parents are critical factors in differentiating children's learning and development.
Parents provide emotional support by expressing approval, by being consistent and nonpunitive in discipline, and by strengthening the child's self-concept.		

Findings	Source	Interpretation
Parent Involvement: At Home (continued)		
When both parents and teachers provide intellectual stimulation and emotional support on a continuing basis, children's development and learning are affected positively.	Shipman, V. *Follow-up of ETS longitudinal study population.* Washington, DC: U.S. Department of Health, Education, and Welfare, 1978. (Contract No. HEW-105-77-1043).	Parents need the help of teachers (staff), and teachers need the help of parents to assure children's optimum learning and development.
Parent Involvement: In Programs		
The more a program concentrates on parents, the more substantial the children's IQ gains. *Teacher/pupil* relationships are more effective than group teaching situations.	Hess, R.D. *Effectiveness of home-based early education center programs.* Paper presented at the meeting of the American Psychological Association, Washington, DC, 1976.	Parents are able to acquire skills to enhance the development of their children.
Home visits to provide parents with information and materials to stimulate preschool children are particularly effective.	*Ibid.*	
More structured activities are more effective than less structured activities.	Goodson, B.D., & Hess, R. *Parents as teachers of young children: An evaluative review of some contemporary concepts and programs.* Stanford, CA: Stanford University School of Education, 1975.	Parents benefit from professionals or paraprofessionals who can help them in the home setting. Parents can learn to structure activities with goals. They can learn to use steps to reach these goals.

Findings	Source	Interpretation
Parent Involvement: In Programs (continued)		
In programs in which mothers are trained to be tutors of their children in their homes, the children show greater immediate gains in intellectual, conceptual, and language development.	Lazar, J.B., & Chapman, F. *A review of the present status and future research needs of programs to develop parenting skills.* Prepared for the Interagency Panel on Early Childhood Research and Development. Washington, DC: George Washington University, Social Research Group, April 1972.	Children benefit immediately if their mothers work with them in language, cognitive, and intellectual activities.
The same positive effects occur in projects involving home visits only, preschool projects operated in the home, preschool plus home visits, or training of mothers with few home visits.	*Ibid.*	Mothers appear to benefit from parent involvement programs, but the kind of parent involvement program does not appear to be critical.
Programs that focus on children and in which parents are involved are effective, even if the parent component is of secondary importance or has incidental emphasis. The effect is greatest on cognitive development, however, when parents participate in a parent educational component aimed at increasing cognitive (intellectual) development.	The Consortium on Developmental Continuity. *The persistence of preschool effects.* Final report (Grant No. 18-76-07843) to the Administration for Children, Youth and Families. Washington, DC: U.S. Department of Health and Human Services, October 1977.	Programs do not have to focus on parents to benefit children. Program goals and objectives for parents are necessary and are more beneficial for the children.

III. Research Relating to Children's Socialization

Early intervention programs in parent-child relationships affect young children's socialization in many ways. Parent education and training programs positively affect parents' childrearing skills as well as the development of children. Parent participation in preschool programs increases positive interaction between parents and children. Parents participate more in later school programs. Children in preschool intervention programs show improvement in social behavior and awareness. Ways of controlling aggression, exciting curiosity, initiating creativity, and maximizing questioning skills also may be improved by early intervention programs. The mainstreaming of handicapped children has a positive effect on their motoric, self-help, social, academic, and communication skills. Because disadvantaged children receive less immediate behavioral or verbal reinforcement in terms of adequacy of acts, a model project for early training has proved effective as an early intervention program.

Findings	Source	Interpretation
Parental Behaviors Leading to Children's Social Competence		
Children's social competence is enhanced by parents who show affection, warmth, acceptance, praise, reward of independence, reasoning, pressure for child's achievement, encouragement for child's verbalization, positive reinforcement, and information giving. Home environments in which parents exhibit warmth and concern produce more competent children in terms of school performance and IQ.	Baumrind, D. Child care practices anteceding three patterns of preschool behavior. *Genetic Psychology Monographs,* 1967, 75, 43-88. Leler, H.O. Mother-child interaction and language performance in young disadvantaged Negro children. *Dissertation Abstracts International,* 1971, 31(8), 4971-B. Radin, N. Father-child interaction and intellectual functioning of four-year-old boys. *Developmental Psychology,* 1972, 6, 353-361. Shipman, V.C. *Disadvantaged children and their first school experience: Interim report.* Princeton, NJ: Educational Testing Service, 1973. Wiegerink, R., & Weikart, D.P. Measurement of mother teaching styles. *Proceedings, 75th Annual Convention,* American Psychological Association, 1967. Pp. 33-334.	Parent training programs can help parents develop appropriate behaviors and home environments.

Findings	Source	Interpretation
Parental Behaviors Leading to Children's Social Competence (continued)		
Parent education and training programs positively affect parents' childrearing skills as well as the development of children.	Johnson, D.L., Kahn, A.J., & Leler, H. *Houston Parent-Child Development Center.* Houston, TX: University of Houston, 1976.	Early intervention programs can be improved by including components aimed at parents' childrearing skills.
Parent participation in preschool programs increases positive interaction between parents and children and parent participation in later school programs. Parents' involvement in Head Start has increased mothers' self-confidence and coping ability.	Brown, B. *Found: Long-term gains from early intervention.* Boulder, CO: Westview Press, 1978.	High parent participation can benefit both parents and children.
	Mann, A.J., Harrell, A., & Hurt, M. *A review of Head Start research since 1969 and an annotated bibliography.* Washington, DC: George Washington University, Social Research Group, May 1977.	
	Love, J., Nauta, M., Coelen, C., Hewett, K., & Ruopp, R. *National Home Start evaluation: Final report.* High/Scope and Abt Associates, March 1976. (Available from: Home Start, Administration for Children, Youth and Families, P.O. Box 1182, Washington, DC 20013)	

Findings	Source	Interpretation
Parental Behaviors Leading to Children's Social Competence (continued)		
	Robinson, J., & Choper, W. The parents speak: Another perspective on the Head Start program. In E. Zigler & J. Valentine (Eds.), *Project Head Start: A legacy of the war on poverty.* New York, NY: Free Press, 1979.	
	MIDCO Educational Association. *Investigation of the effects of parent participation in Head Start.* Denver, CO: MIDCO, October 1972. (Available from: MIDCO, 10403 West Colfax Avenue, Denver, CO 80215.)	
Child Socialization		
Extroversion, task orientation, and adjustment correlate positively with intellectual development; but distractibility and hostility correlate negatively.	Mann, Harrell, & Hurt, *op. cit.*	Intervention programs can create situations that require children to take part in self-initiating, exploratory, persistent, and independent activities.
	Benson, G.P., & Knipers, J.L. *Personality correlates of intellectual performance among Head Start children,* 1974. (ERIC document: ED 097-121. Available from: ERIC Document Reproduction Service, Computer Microfilm International, P.O. Box 190, Arlington, VA 22210.)	
Children in preschool intervention programs show improvements in social behavior in the areas of social awareness, awareness of others, interpersonal comprehension, and tolerance.	Mann, Harrell, & Hurt, *op. cit.*	Intervention programs that include child socialization can make a positive impact on children's social behavior.
	Benson & Knipers, *op. cit.*	

Findings	Source	Interpretation
Aggression in Children		
Aggression stems in part from too much or too little discipline at home and from parent behavior. Children will model adult behavior.	Appel, M.H. Aggressive behavior of nursery school children and adults: Procedures in dealing with such behavior. *Journal of Experimental Education*, 1942, 11, 185-199.	Aggression can be prevented. Parents need the help of teachers (staff) in understanding children's need for discipline and how to discipline their children appropriately. Teachers can provide examples of loving adults who cope without showing anger.
Aggression is a hostile action that induces fear or flight or inflicts force on others.	Gordon, J.E., & Smith, E. Children's aggression, parental attitudes, and the effects of an affiliation-arousing story. *Journal of Personality and Social Psychology*, 1965, 1, 654-659.	
	Sears, E.R., Maccoby, E.E., & Levin, H. *Patterns of child rearing.* Stanford, CA: Stanford University Press, 1957.	
Effective ways of controlling aggression include a teacher diverting the child from the object of his aggression, separating children, explaining the rights and feelings of other children, and rational explanation. Disapproving, moralizing, and failing to understand or show sympathy are not effective.	Appel, *op. cit.*	Overaggressiveness in children can be controlled by approaches that teachers and parents can be taught.
Curiosity, Creativity, and Question Asking		
Curious children find new solutions to problems and recognize and solve new problems. They are more creative, have more positive self-concepts, and exhibit less anxiety. Children low in curiosity have trouble meeting the demands of school.	Maw, W.M., & Maw, E.W. Nature of creativity in high and low curiosity boys. *Developmental Psychology*, 1970, 2, 325-329.	Curiosity is an important trait that parents and teachers can nurture in children.
	Maw, W.M., & Maw, E.W. Self-concept of high and low curiosity boys. *Child Development*, 1970, 41, 123-129.	

Findings	Source	Interpretation
Curiosity, Creativity, and Question Asking (continued)		
Children fail to explore and gain experience because they lack information skills. Most preschool programs increase curiosity, but those that provide sequences and tasks, manipulation of objects, and have high academic content show the greatest gains. Children explore more when given novel objects and experience adult attentiveness, sensitivity, and support. They explore more when exposed to friendly, approving adults rather than aloof critical adults. Children learn curiosity by modeling or imitating adults.	Minuchin, P. Correlates of curiosity and exploratory behavior in preschool disadvantaged children. *Child Development,* 1971, 42, 936-950. Torrance, E.P. Creativity in the educational process. In G.S. Lesser (Ed.), *Psychology and educational practice.* Glenview, IL: Scott Foresman, 1971. Maw, W.M., & Maw, E.W. Self-concept of high and low curiosity boys, *op. cit.* Bradbard, J.R., & Endsley, R.C. How can teachers develop young children's curiosity? *Young Children,* 1980, 35(5), 21-32. Torrance, E.P. Freedom to manipulate objects and question-asking performance of six-year olds. *Young Children*, December 1970, 26(2), 93-97. Nunnally, J.C., & Lemond, L.C. Exploratory behavior and human development. In H.W. Reese (Ed.), *Advances in child development and behavior* (Vol. 8). New York, NY: Academic Press, 1973.	Parents and teachers can increase children's curiosity and creativity.

Findings	Source	Interpretation
Curiosity, Creativity, and Question Asking (continued)		
	Rubenstein, J. Maternal attentiveness and subsequent exploratory behavior in infants. *Child Development*, 1976, 38, 1089-1100.	
	Moore, S.G., & Bulbulian, K.N. The effects of contrasting styles of adult-child interaction on children's curiosity. *Developmental Psychology*, 1976, 12, 171-172.	
	Johns, C., & Endsley, R.C. The effects of maternal model on young children's tactual curiosity. *Journal of Genetic Psychology*, 1977, 131, 21-28.	
Providing objects to manipulate maximizes children's question-asking skills. Children ask more questions when they receive informative answers to their questions.	Ross, H.S., & Killey, J.C. The effect [illegible]uestioning on retention. *Child Development*, 1977, 48, 312-314.	Teachers can encourage and maintain questioning by providing informative answers. Teachers can let children ask some of the questions about preschool work. Children need to ask their own questions.
	Endsley, R.C., & Gupta, S. Group size as a determinant of preschool children's frequency of question asking. *Journal of Genetic Psychology*, 1978, 132, 317-318.	
	Bradbard & Endsley, *op. cit.*	

Findings	Source	Interpretation
Mainstreaming Handicapped Children		
Handicapped children, ages 3 to 5, can be helped by preschool programs. Preschool programs can effectively screen, diagnose, and treat handicapped children.	U.S. Department of Health and Human Services. *The status of handicapped children in Head Start programs: 7th annual report to the Congress of the U.S. on services provided to handicapped children in Project Head Start.* Washington, DC: U.S. Department of Health, Education, and Welfare, February 1980.	Preschool programs can identify and treat young handicapped children before they enter public schools. Children benefit from earlier treatment.
	Karnes, M.B., & Lee, R.C. Mainstreaming in the preschool. In L.G. Katz (Ed.), *Current topics in early childhood education.* Norwood, NJ: ABLEX Publishing Corporation, 1979.	
Handicapped children can be mainstreamed (integrated) into a preschool program. Head Start handicapped children show gains in motoric, self-help, social, academic, and communication skills (especially speech impaired children).	*Ibid.*	There is no need to segregate preschool handicapped children or treat them in isolation.
	Applied Management Sciences (AMS). *Evaluation of the process of mainstreaming handicapped children into Project Head Start.* Silver Spring, MD: AMS, April 1978. (Available from: AMS, 962 Wayne Avenue, Silver Spring, MD 20910.)	

SECTION TWO
THEORY-BASED INTERVENTION PROGRAMS

Although findings from individual research studies are important and useful, there are large bodies of theory-based knowledge that reflect knowledge gained from many studies and from professional practice accumulated over many years. There are a number of early intervention programs that are theory based. These programs include those based on (1) theories of development, and (2) theories of the component skills involved in language or reasoning, or learning theories. While no single theory can provide all of the goals for an educational program for children, the theory base provides a framework around which planners and teachers can develop goals and learning experiences consistent with a theoretical perspective. While broad-scale comparative studies have not determined a single *best* approach, recent longitudinal studies have found that early childhood intervention *increases* positive attitudes and commitment to schooling and *decreases* the numbers of students placed in special education or retained in grade.

IV. Piaget Theory

Piaget's theory suggests that children undergo a process of cumulative development of their ability to reason and think critically in objective and abstract terms. This process develops in stages:

Age	*Stage*
0-2	Sensory-motor
2-7	Preoperational Thought
7-11	Concrete Operations
over 11	Formal Operations

References

Colvin, R.W., & Zaffiro, E.M. *Preschool education.* New York, NY: Springer, 1974.

Evans, E.D. *Contemporary influences in early childhood education* (2nd Edition). New York, NY: Holt, Rinehart & Winston, Inc., 1975.

Elkind, D., & Flavell, J. (Eds.). *Studies in cognitive development.* New York, NY: Oxford, 1969.

Barth, H.G. Piaget and knowledge. *Theoretical foundations.* New York, NY: Prentice-Hall, Inc., 1969.

Teaching Strategies (Operational Goals)

Preschool intervention programs can facilitate development during the preoperational stage and help the child more effectively to reach the symbolic mental activity stage.

Some age appropriate learning experiences suggested by Piagetian theory appear to be effective means of improving the life chances of preschool children. The Piagetian approach to early intervention merits consideration in designing a curriculum, especially related to age appropriateness of interventions and such curriculum content areas as learning how to classify and order physical objects.

Piaget Theory (continued)	References	Teaching Strategies (Operational Goals)
Adults and children see the world differently and think differently.	Colvin & Zaffiro, *op. cit.*	Educators must recognize that preschool children can perform some intellectual and motor tasks, but are unable to do many other tasks that can be done easily by adults. The child's perception of the world is determined by his level of cognitive organization.
As children grow, intellectual development takes place in a series of steps or stages.	*Ibid.*	Preschool programs can be geared to the child's stage of intellectual growth. Teachers can use Piaget's techniques to see how well a child grasps a concept and at what level the child is functioning.
Each stage of intellectual growth involves the presence or absence of specific cognitive functioning.	*Ibid.*	Preschool curricula can be targeted at children's intellectual abilities. The preschool can provide the child with information and environments organized to match the child's thought processes.
Every concept the child has at a given time is related to the network of all the other concepts he has built. Knowledge is not received passively. The child actively constructs his knowledge through contact with his physical and social environment.	*Ibid.*	Children build up their perceptions, knowledge, and thinking skills gradually as they undergo different experiences. Educators can guide children through their stages of development by providing experiences at appropriate times.

Piaget Theory (continued)

Intellectual development can be accelerated by providing the right kind of experiences at the right time for the developing child.

Gordon Curriculum Goals

- Enhance intellectual and personality development of child. Emphasize age appropriate Piagetian concepts.
- Emphasize psychomotor, cognitive, and affective development (ages 0 to 3).
- Teach parents to work with their children at the child's developmental level.

Kamii and DeVries Curriculum Goals

- Strengthen the preoperational thinking process.

References

Ibid.

Gordon, I.J., Guinagh, B., & Jester, R.E. The Florida parent education infant and toddler programs. In M.C. Day & R.K. Parker (Eds.), *The preschool in action* (2nd Edition). Boston, MA: Allyn & Bacon, Inc., 1977.

Kamii, C.K. Piaget's theory and specific instruction: A response to Bereiter and Kohlberg. *Interchange*, 1970, 1, 33-39.

Teaching Strategies (Operational Goals)

Curricula have been devised to give age appropriate experiences in classifying, ordering, and understanding the numerical relationships among physical objects; in understanding potential relationships; and in being able to reason about time. Within the limits of the child's developmental stage, it is possible to speed up the acquisition of basic concepts and operations.

Piagetian technique can be used by parents. A curriculum based on psychomotor developmental tasks for infants and toddlers can be used effectively to help disadvantaged children.

Kamii seeks to build physical knowledge of objects in order to build a repertoire of social knowledge and to build

Kamii and DeVries Curriculum Goals (continued)

- Stress cognitive objectives.
- Coordinate cognitive and socio-emotional growth (ages 4 to 5).

References

Kamii, C.K. Evaluation of learning in preschool education: Socioemotional, perceptual-motor, and cognitive development. In B.S. Bloom *et al.* (Eds.), *Handbook on formative and summative evaluation of student learning.* New York, NY: McGraw-Hill, 1971.

Kamii, C.K. An application of Piaget's theory to the conceptualization of preschool curriculum. In R.K. Parker (Ed.), *The preschool in action.* Boston, MA: Allyn & Bacon, Inc., 1972.

Kamii, C.K., & DeVries, R. *Piaget for early education.* New York, NY: Prentice-Hall, Inc., 1974.

Kamii, C.K., & Radin, N.A. Framework for preschool curriculum based on some Piagetian concepts. In I.J. Athey & D.O. Rubadeau (Eds.), *Educational implications of Piaget's theory.* Waltham, MA: Ginn-Blaisdell, 1970.

Teaching Strategies (Operational Goals)

logical mathematical knowledge appropriate for the preoperational period in the program:

- Children learn logical knowledge through classification and seriation and by reasoning about numbers, space, and time.
- Children learn physical knowledge by manipulating physical objects.
- Children learn representation by structuring their knowledge progressively and symbolizing it.
- Children learn social knowledge by dealing with people and learning social rules.

Lavatelli Curriculum Goals

- Learn classification and other skills in sequence of development.
- Help children in acquiring logical ways of thinking.
- Child works with concrete materials (ages 4 to 6).

Weikart Curriculum Goals

- Stress primarily cognitive objectives.
- Help the child to develop logical modes of thought.
- Help the child to manipulate symbols to act on and represent the environment (ages 3 to 4).

References

Lavatelli, C.S. A Piaget-derived model for compensatory preschool education. In J.L. Frost (Ed.), *Early childhood education rediscovered.* New York, NY: Holt, Rinehart & Winston, Inc., 1968.

Lavatelli, C.S. *Piaget's theory applied to an early childhood curriculum.* New York, NY: Learning Research Associates, 1970.

Consortium for Longitudinal Studies, *op. cit.*

Weikart, D.P., Deloria, D.J., & Lawser, S. Results of a preschool intervention project. In S. Ruan (Ed.), *A report on longitudinal evaluation of preschool programs.* Vol. 1. Washington, DC: Office of Child Development. USDHEW Publication No. (OCD) 74-24, 1974. Pp. 125-133.

Weber, C.U., Foster, P.W., & Weikart, D.P. An economic analysis of the Ypsilanti Perry Preschool Project. *Monographs of the High/Scope Educational Research Foundation, No. 5,* 1978.

Teaching Strategies (Operational Goals)

Lavatelli adds a Piagetian-based cognitive underpinning to preschool practices that are otherwise well established in the program:

- Children work with concrete materials.
- Children solve problems to develop skills in classification, seriation, numbers, and space and measurement.
- Training sessions are structured and have a duration that depends upon the attention span of the child.

Weikart seeks to help children to develop logical modes of thought in order: to gain knowledge about self and objects; to see relationships between self and environment and between self and groups; and to order objects and events in his program.

- Children learn to classify by grouping objects on the basis of attributes, such as function and shape.
- Children learn to order objects on the basis of size, quantity, and quality.

Weikart Curriculum Goals (continued)

References

Weikart, D.P., Bond, J.T., & McNeil, J.T. The Ypsilanti Perry Preschool Project: Preschool years and longitudinal results. *Monographs of the High/Scope Educational Research Foundation, No. 3,* 1978.

Weikart, D.P., Deloria, D.J., & Lawser, S. Longitudinal results of the Ypsilanti Perry Preschool Project. *Monographs of the High/Scope Educational Research Foundation, No. 1,* 1978.

Teaching Strategies (Operational Goals)

- Children learn to describe the position of their bodies and other objects in space.
- Children learn to deal with time.
- Children are taught at verbal and motor levels.

V. Montessori Theory

Maria Montessori was the only theorist, besides Piaget, who offered guidance in developing comprehensive early educational programs. Montessori believed that a child's mind is a dynamic whole, which transforms its structure by active experience obtained from its surroundings. She felt that competence and motivation exist from the start of life and the mere presence of activities will arouse them. Thus, cognitive activities should be self-selected and self-directed, "... liberty is activity." The free activity is balanced by [illegible] and control. However, these come from the way in which the environment is organized and not from the teacher. The practice of early education in a Montessori school would require a teacher:

1. to design materials so that learning occurs through activity
2. to let the child select materials or activities at the child's own pace
3. to construct materials or activities that the child can use with minimal instruction
4. to design materials that are self-correcting and do not require the teacher to judge success
5. to construct a child-size world in which the child carries on adult-like activities

Montessori Theory (continued)

Like Piaget, Montessori believed in *sequence*. The child should be able "To distinguish, classify and catalogue on the basis of a secure order established in the mind. . . ." Thus, she taught children to discriminate sensory qualities such as color, pitch or size; to order quantities along a dimension, such as light-dark or big-small, and to differentiate and integrate sensory dimensions such as the appearance of length or degree of loudness.

The goals of Montessorians are also likely to include the encouragement of the child's autonomy, sense of success in academic areas, self-concept, an understanding of mathematical and geometric concepts, and the development of a world-wide perspective on history, geography, and social studies.

Reference:

Chattin-McNichols, J.P. The effect of Montessori School experience. *Young Children*, July 1981.

Findings	Source	Interpretation
Impact on Intelligence		
Montessori preschool training has positive short-term effects upon general intelligence for disadvantaged children.	Miller, L., & Dyer, L. Four preschool programs: Their dimensions and effects. *Monographs of the Society for Research in Child Development*, 1975, 40 (5-6, Serial No. 162).	Like most preschool programs for disadvantaged children, Montessori training has large short-term impacts.
	Dreyer, A.S., & Rigler, D. Cognitive performance in Montessori and nursery school children. *Journal of Educational Research*, 1969, 62, 411-416.	
	Stodolsky, S.S., & Karlson, A.L. Differential outcomes of a Montessori curriculum. *Elementary School Journal*, May 1972, 419-434.	

Findings	Source	Interpretation
Impact on Intelligence (continued)		
The Montessori program compares favorably with traditional preschools, and is less effective than cognitive or academic programs such as Bereiter-Engelmann, or the Karnes Ameliorative Program.	Karnes, M. *Research and Development Project on Preschool Disadvantaged Children.* Washington, D.C.: U.S. Office of Education, 1969.	The comparatively low rate of verbal interaction may be at least partially responsible for being less effective — Karnes found that the Montessori children, particularly those on the low IQ range, made continuing IQ gains, suggesting that the program was relatively effective in establishing improved intellectual functioning with children who initially had indicated limited potential.
Gains appear to be more resistant to decline over time.	*Ibid.*	This trend appears to continue, at least until the children are in 6th and 7th grades.
	Di Lorenzo, L. *et al. Pre-kindergarten programs for educationally disadvantaged children.* New York State Education Department, 1969.	
	Consortium for Longitudinal Studies. *Lasting effects after preschool.* Final report (Grant No. 90C-1311) to the Administration for Children, Youth and Families, Office of Human Development Services. Washington, D.C.: U.S. Department of Health, Education, and Welfare, October 1978.	

Findings	Source	Interpretation
Impact on Achievement.		
On measures of academic achievement and school readiness, preschool programs that emphasize direct training in academic areas and in language skills produce greater gains on these kinds of measures than Montessori programs; but, in turn, Montessori training appears to produce greater gains on these kinds of measures than traditional nursery schools.	Karnes, *op. cit.* Miller & Dyer, *op. cit.* Bereiter, C. *Acceleration of intellectual development in early childhood.* Washington, D.C.: Department of Health, Education and Welfare, U.S. Office of Education, Bureau of Research, 1967.	Direct verbal instruction group performed significantly better than the Montessori-trained group in reading, spelling, and arithmetic.
Impact on Ability to Attend		
Montessori preschool training is effective in getting children to pay prolonged attention to school-related tasks.	Kohlberg, L. Montessori with the culturally disadvantaged: A cognitive-developmental interpretation and some research findings. In R.D. Hess & R.M. Baer (Eds.), *Early education,* Chicago, IL: Aldine, 1968.	The children were less likely to be distracted from their work than children in a permissive classroom.

VI. Additional Models Based on Theories

Some models specify certain skills that are considered critical for competent performance in language usage and problem solving, and the education programs are designed to provide instruction in those specific skills. In contrast to the ideas of the models using developmental theory as a framework, the assumption of these models is that young children must internalize *a need to learn,* and that the acquisition of this need requires positive reinforcement. The over-riding goal is to prepare children for success in school.

Karnes GOAL (Game-Oriented Activities for Learning Curriculum)

This curriculum is Psycholinguistic Theory as exemplified in the clinical model of the Illinois Test of Psycholinguistic Abilities (ITPA) and J.P. Guilford's Theory of Structure of the Intellect.

Karnes assumes that success in school is related to the development of language processing skills. Lesson plans are classified under 11 subheadings derived from the Illinois Test of Psycholinguistic Abilities:

- Visual Reception
- Auditory Reception
- Visual Sequential Memory
- Auditory Sequential Memory
- Visual Closure
- Auditory Closure
- Grammatic Closure
- Auditory Association
- Visual Association
- Verbal Expression
- Manual Expression

Learning Experiences in Math, Science, Social Studies, Art, Music and Movement, and Directed Play are based on content of the standard school curriculum.

References:

Karnes, M.B. Implications of research with disadvantaged children for early intervention with the handicapped. In J.B. Jordan & R.F. Dailey (Eds.), *Not all little wagons are red.* Arlington, VA: Council for Exceptional Children, 1973. Pp. 46-65.

Karnes, M.B. Evaluation and implications of research with young handicapped and low-income children. In J.C. Stanley (Ed.), *Compensatory education for children, ages 2-8, Recent studies of educational intervention: Proceedings.* Baltimore, MD: Johns Hopkins University Press, 1973.

Karnes, M.B. *et al. Investigations of classroom and at-home interventions (Vol. 1): Research and development program on preschool disadvantaged children. Final Report.* Bethesda, MD: ERIC Document Reproduction Service No. ED 036-663, 1969.

Karnes, M.B., Zehrbach, R.R., Studley, W.M., & Wright, W.R. *Culturally disadvantaged children of high potential: Intellectual functioning and educational implications.* Champaign, IL: Champaign Community Unit 4 Schools, September 1965.

Findings	Source	Interpretation
Karnes GOAL (continued)		
The Karnes model has had long-term impacts on the school-related functioning of disadvantaged children.	Consortium for Longitudinal Studies, in press.	The Karnes data on long-term effects are in substantial agreement with other data on the long-term effects of early intervention.

Bereiter-Engelmann Direct Instruction/Distar Model

This model is based on learning theory. The motivation to learn is seen as contingent upon events in the environment. It assumes (1) that learning, defined as "changes in behavior," is most efficiently induced through rewards or reinforcements for correct responses, (2) what is most important in the development of the child is his learning of cognitive and moral knowledge and rules of the culture, and (3) that the teaching of such information is best accomplished through direct instruction.

Engelmann, *et al.* have developed the preschool direct instruction approach and Distar Language approach to teach specific information and rules in the areas of language, arithmetic, and reading. Instruction is teacher-directed, fast-paced, and uses both verbal and nonverbal reinforcers.

Objectives include:

- ability to use affirmative and "not" statements in reply to questions
- ability to handle polar sets (big-little, up-down)
- ability to perform simple if-then deductions
- ability to name the basic colors
- ability to count objects correctly up to 10
- ability to recognize the vowels and at least 15 consonants
- a sight reading vocabulary of at least four words

The program also prescribes class management techniques, instructional pacing techniques, and group management techniques.

Bereiter-Engelmann Model (continued)

References:

Bereiter, C., & Engelmann, S. *Teaching disadvantaged children in the preschool.* Englewood Cliffs, NJ: Prentice-Hall, 1966.

Engelmann, S., Osborn, J., & Engelmann, T. *Distar Language 1, An instructional system.* Chicago, IL: Science Research Associates, 1969.

Findings	Source	Interpretation
Children in the Bereiter-Engelmann program showed higher scores in reading, spelling and arithmetic.	Bereiter, *op. cit.*	Highly didactic programs may prepare children to function well in structured lesson situations, but may reduce cognitive flexibility and problem-solving initiative. Cognitive and academically oriented programs have a greater immediate effect on school-related abilities.
	Miller & Dyer, *op. cit.*	
	Karnes, *op. cit.*	
	Consortium for Longitudinal Studies. *Lasting effects after preschool, op. cit.*	Cognitively-oriented preschool programs, like other well-run programs, have long-term benefits.

Early Training Project (ETP) Model

The ETP model stresses appropriate reinforcement of behavior. The ETP Model is designed to help the following problems:

Disadvantaged children get less reinforcement of behavior, and the reinforcement they do receive is less likely to be from adults or to be verbal.

ETP Model (continued)

Disadvantaged children get less reinforcement in terms of adequacy of specific acts. ("You tied your shoe just right.") Reinforcement often is directed toward inhibitory behavior.

Disadvantaged children get less reinforcement that is immediate, without stress on delay of gratification or use of exploratory behavior.

The techniques used by the ETP include:

Give more delayed rewards. Help child to internalize his own reward system. Reward exploratory behavior.

Start with nonverbal awards (pat, hug, give cookie) and proceed to move to verbal and symbolic rewards (praise, gold star).

Give more specific reinforcement in terms of child's performance. Give positive reinforcement on tasks well done. Reinforcement should be just within the child's level of ability.

Reference:

Gray, S.W., & Klaus, R.A., *et al. Before first grade*. New York, NY: New York Teachers College Press, 1966.

Findings	Source	Interpretation
The ETP Model, which is designed to help the problems listed above, has proved to be an effective early intervention program.	Consortium for Longitudinal Studies. *Lasting effects after preschool, op. cit.*	Early intervention programs based on reinforcement can serve the needs of disadvantaged children.

Bank Street Model

The goals of the Bank Street Model are based on theoretical principles derived from *developmental and psychodynamic theory.* The Bank Street Model combines cognitive theories of Piaget and Werner with psychodynamic theories of Freud, Erickson, Sullivan and Hartman.

Goal	Reference	Teaching Strategies (Operational Goals)
Bank Street Model (continued)		
• To serve child's need to make an impact on the environment through direct physical contact and maneuver	Biber, B., & Franklin, M.B. The relevance of developmental and psychodynamic concepts to the education of the preschool child. *Journal of the American Academy of Child Psychiatry*, 1967, 6, 5-24.	Biber suggests specific teaching strategies and learning activities to *operationalize goals:* • Exploring the physical world: equipment, space, physical protection. • Constructive, manipulative activities with things (Presymbolic): variety of materials – blocks, clay, wood, sand.
• To promote potential for ordering experience through cognitive strategies	Biber, B., & Minuchin, P. The role of the school in the socialization of competence. In B.C. Rosen & H.J. Crockett, Jr. (Eds.), *Achievement in American society.* Cambridge, MA: Schenkman Publishing Co., 1961. Biber, B., Shapiro, E., & Wickens, D. *Promoting cognitive growth from a developmental-interaction point of view.* Washington, DC: National Association for the Education of Young Children, 1971. Shapiro, E. Educational evaluation: Rethinking the criteria of competence. *School Review*, August 1973, 81(4), 523-549.	• Extending receptiveness and responsiveness variety of experiences that focus on observation and discrimination. • Extending modes of symbolizing: two-dimensional representation with pencil, crayons, paints; three-dimensional representation with clay, blocks, wood. • Developing facility with language: word meanings and usage, scope of vocabulary, mastery of syntax, playful and communicative verbal expression. • Stimulating verbal-conceptual organization of experience and information.

Goal	Reference	Teaching Strategies (Operational Goals)
Bank Street Model (continued)		
• To advance the child's functioning knowledge of his environment		• Observation of functions within school; e.g., heating, water pipes, kitchen, elevator. • Story reading; e.g., stories about nature, work processes, people's roles and functions. • Observation of functioning environment outside the school.
• To support the play mode of incorporating experience		• Nourishing and setting the stage for dramatic play activity.
• To help the child internalize impulse control		• Communicating a clear set of non-threatening controls: limits, rules, regulations. • Creating a functional adult authority role.
• To meet the child's need to cope with conflicts intrinsic to this stage of development		• Dealing with the conflict over possession displaced from the family scene. • Alleviating conflict over separation related to loss of familiar context of place and people.
• To facilitate the development of an image of self as a unique and competent person		• Increasing knowledge of self. • Advancing integration of self.
• To help the child establish mutually supporting patterns of interaction		• Building informal communication channels, verbal and nonverbal. • Cooperative and collective child group relations.

Goal	Reference	Teaching Strategies (Operational Goals
Bank Street Model (continued)		• Establish models of human interchange that value individuality.
The Bank Street Model has been effective in producing immediate gains in school-related abilities.	Shapiro, E., & Biber, B. The education of young children: A developmental-interaction approach. *Teachers College Record,* 1972, 74(1), 55-79.	Models combining several theories can be effectively employed with preschool children.

VII. Evaluations of Theory-Based Intervention Programs

Evaluations of theory-based intervention programs have been limited in scope and have been characterized by methodological problems. The more recent studies of Miller and Dyer (1975), the Consortium for Longitudinal Studies (1978), and Schweinhart and Weikart (1980) have corrected some of these problems and have provided cross-comparison and longitudinal data on the effects of early intervention programs.

Findings	Source	Interpretation
Miller and Dyer (1975) investigated the overall effects as well as model-specific effects of four theory-based intervention programs — Bereiter and Engelmann, Darcee, Montessori, and a traditional program.	Miller & Dyer, *op. cit.*	
All experimental children outperformed control children on intellectual measures. The Bereiter-Engelmann Model was the most effective overall in improving children's performance on general cognitive and school content		The impact of each of the four programs was consistent with program goals and emphases.

Findings	Source	Interpretation
measures. On a measure of innovative solutions to a problem, DARCEE and Montessori groups scored significantly higher than the Bereiter-Engelmann and traditional groups.		
In an analysis of seven relevant projects concerning the effects of early intervention on cognitive ability, the amount of IQ advantage at school entry is greater in the programs that enrolled children up to the time of school entry.	Consortium for Longitudinal Studies. *Lasting effects after preschool, op. cit.*	When lasting improvement in cognitive ability is a goal, it is likely that the earlier the intervention, the better.
	Consortium for Longitudinal Studies. *The persistence of preschool effects.*	Gordon's program was shown to have lasting effects.
In eight projects, children enrolled in intervention projects were less likely to be placed in special education or retained in grade than control children.	Darlington, R.B. *et al.* Preschool programs and later school competence of children from low income families. *Science,* 1980, 308, 202-204.	Since special education and retention in grade costs nearly twice as much as regular education placement, investment in early intervention programs may be cost effective for society.
In a study of effects of early intervention at age 15, children in Weikart's Perry Preschool Project were found to have an increased cognitive ability at school entry, compared with a group of control children not enrolled in the project. Perry Preschool children were	Schweinhart, L.J., & Weikart, D.P. Young children grow up: The effects of the Perry Preschool Program on youths through age 15. *Monographs of the High/Scope Educational Research Foundation, No. 7.* Ypsilanti, MI: High/Scope Educational Research Foundation, 1980.	Preschool education raises cognitive ability at school entry. It is hypothesized that a more favorable entry into school introduces the child to the success flow of the school, increasing commitment to schooling as well as the ability to perform school tasks. Pre-

Findings	Source	Interpretation
more successful in school, had higher school achievement, and spent fewer years in special education. Completion of schooling and fewer years in special education combined in leading to fewer delinquent offenses.		school may provide a social and emotional adaptation as well as an academic or cognitive head start.